CloudStack Release Notes Documentation

Release 4.5.1

Apache CloudStack

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This document contains information specific to this release of CloudStack, including upgrade instructions from prior releases, new features added to CloudStack, API changes, and issues fixed in the release. For installation instructions, please see the CloudStack Installation Guide. For usage and administration instructions, please see the CloudStack Administrator's Guide.

Contents:

CHAPTER 1

What's New in 4.5

Version 4.5.1 includes more than 200 bug fixes from previous release, the following new features and improvements.

1.1 NuageVsp Network Plugin

The Nuage NetworksTM Virtualized Services Platform (VSP) is a Software-Defined Networking (SDN) solution that virtualizes any datacenter (DC) network infrastructure and automatically establishes connectivity between compute resources upon their creation.

NuageVsp networking plugin bring the Nuage VSP network virtualization technology to CloudStack. All the network isolation and routing is handled by the Nuage SDN solution. Routing of the packets happen at hypervisor itself. Virtual Router is not used for routing the packets and is spawned only for Password reset functionality. The Nuage solution also helps significantly improve the agility and scale of a CloudStack deployment as compared to a Virtual Router based deployment.

Supported hypervisors:	XenServer, VMware
Link	NuageVsp Network Plugin spec

1.2 Bind integration with Globo DNSAPI

GloboDNS provide API to Bind DNS server used to centralized DNS server outside of CloudStack networks. When deploying Advanced Networks, Virtual Routers are used to isolate networks and provide DNS service for all machines inside each network. This approach imposes a challenge when instances need to translate names that belong to instances from another network.

Supported hypervisors:	Any
Link	Globo DNSAPI spec

1.3 SAML 2.0 Plugin

SAML 2.0 Plugin provide integration of CloudStack to existing authentication mechanism. This provide Single Sign On (SSO) and Single Log Out (SLO) to work on CloudStack UI and clients. SAML (Security Assertion Markup Language) 2.0 is an old, stable and widely used XML based authentication and authorization protocol supported by Salesforce, Google Apps and other public and private companies and the aim is to integrate the SSO SAML support in CloudStack. The current implementation is experimental, will change in future and should be avoided in prouduction.

Supported hypervisors:	N/A
Link	SAML spec

1.4 Managed storage for KVM

This adapter provides one to one mapping between SAN volume to VM's disk. This is to guarantee quality of services for performance sensitive applications. This adapter is based on nfs protocol.

Supported hypervisors:	KVM
Link	CLOUDSTACK-7576

1.5 Improved CloudByte Storage Plugin

The new improved CloudByte plugin support the following features:

- Managed storage, where each vm disk has the guaranteed QoS.
- Account integration in cloudbyte with respect to domains in CloudStack.
- Resize of the volume.
- both iSCSI and nfs protocols in XenServer.
- iSCSI protocol for KVM and VMware ESX.
- Storage level snapshot capabilities as well as hypervisor level snapshot feature.
- Expose custom API's for ui integration.
- Unlimited storage nodes across the sites.

Supported hypervisors:	KVM, VMware, XenServer
Link	CLOUDSTACK-7098

1.6 Use SSH for commands sent to Virtual-Router

For XenServer host, sending commands to Virtual-Routers now use SSH, previously using XAPI plugin, this change reduce XAPI workload and allow Virtual-Router update while XenServer pool master is down.

Supported hypervisors:	XenServer
Link	CLOUDSTACK-6314

1.7 Baremetal Advanced Networking Support

This feature is about CloudStack network plugin for baremetal advanced networking. With this plugin, CloudStack can automatically program vlan on physical switch to which baremetal instances connect when creating/destroying baremetal instance. This feature cannot work standalone, it needs support from physical switch itself either from vendor's SDK or from an in-switch agent for whitebox switch. When using this feature, baremetal instances gain Layer 2 isolation methods provided by CloudStack advanced networking which is particularly useful in public cloud that wants to provide baremetal as a service.

Supported hypervisors:	N/A
Link	Baremetal feature spec

1.8 Instance Password Generation length can now be changed

For instance using random password generated by CloudStack, Password length and encoder can now be define with following Global Settings: `vm.password.length`, `user.password.encoders.exclude`, `user.password.encoders.order`

1.9 Improvements

- [UI] keep advanced search parameters visible after search has been run
- [UI] Add new vGPU types K160Q, K180Q, K280Q
- [LXC] storage migration for LXC VMs fixed
- Use of MariaDB as cloudstack management server database
- System VM password reset now supported
- Root volume detach support
- System VM local storage setting `system.vm.use.local.storage` is configurable at zone level
- Ability to set CPU features for user vms on KVM using `guest.cpu.features` property
- A threaded Python based password server that consumes less RAM and CPU
- VMFS support in VMWare
- XenServer 6.5 support
- Separate /var/log partition in SystemVM template
- VMXNET3 nic adapter support for KVM
- `nicAdapter` VM detail is configurable for VMWare to set custom nic adapter
- New secure and default user authenticator: PBKDF2-SHA-256
- Resize volume support on KVM

CHAPTER 2

Issues Fixed in 4.5

Apache CloudStack uses Jira to track its issues. All new features and bugs for 4.5.1 have been tracked in Jira, and have a standard naming convention of "CLOUDSTACK-NNNN" where "NNNN" is the issue number.

2.1 Issues Fixed in 4.5.1

For the list of issues fixed, see Issues Fixed in 4.5.1.

Bug ID	Description
CLOUDSTACK-8221	Testing on CS 4.5 SystemVM Need all Security Vulnerability...
CLOUDSTACK-8171	Lock related warnings seen in 4.5/master related to template_spool_ref2...
CLOUDSTACK-8168	Parameter validation API does not check params exhaustively...
CLOUDSTACK-8094	Label Issue for Migrate Volume Option in UI...
CLOUDSTACK-7997	[Automation] Deployment of VM is failing on Basic Zone in Few Cases - Unable to ...
CLOUDSTACK-7948	[Automation] Two "VOLUME.DELETE" Events are being registered instead of one - On...
CLOUDSTACK-7925	test_lb_secondary_ip.py- test cases failing while creating port forwarding rule...
CLOUDSTACK-7594	[Task] Add test path test cases for Stopped VM...
CLOUDSTACK-7348	[Automation] InvalidParameter Exception with stacktrace in MS log wile executing...
CLOUDSTACK-7283	Allow regular user to execute listUsers API call...
CLOUDSTACK-6885	system-vm rsyslog logs rotation does not work properly...
CLOUDSTACK-6067	UI does not list routers matched by search string...
CLOUDSTACK-5874	Cannot delete events for deleted accounts...

2.2 Issues Fixed in 4.5.0

For the list of issues fixed, see Issues Fixed in 4.5.1.

Bug ID	Description
CLOUDSTACK-8283	primary storage limit check not working...
CLOUDSTACK-8244	LibvirtServerDiscoverer.java has hard coded agent class...
CLOUDSTACK-8166	Usage data boundary condition and NPE...
CLOUDSTACK-8140	secstorage.service.offering in GS set to service offering ID Webui fails to star...
CLOUDSTACK-8101	volume sync not working as expected - MS restart during upload volume leaves vol...
CLOUDSTACK-8093	Not able to list shared templates by passing id....
CLOUDSTACK-8077	Not able to deploy VM using a shared template....
CLOUDSTACK-8072	NPE in deleting default ACL item...
CLOUDSTACK-8061	Extracting volume when it is in migrating state causes both the operations to fa...
CLOUDSTACK-7994	Network rules are not configured in VR after out-of-band movement due to host cr...
CLOUDSTACK-7986	[F5 LB] Failed to execute IPAssocCommand due to com.cloud.utils.exception.Execut...
CLOUDSTACK-7981	listVirtualMachine is too slow in case of duplicate resource tags due to joining...
CLOUDSTACK-7974	deleted VM entries still exists in /etc/hosts and /etc/dhcphosts.txt files on vi...
CLOUDSTACK-7954	ListTags API is ignoring the resourceID and displaying all the tags of all resou...
CLOUDSTACK-7952	listSslCerts returns private key...
CLOUDSTACK-7951	cloudstack-agent jsvc gets too large virtual memory space....
CLOUDSTACK-7917	Load Balancer Rule is not validated when updating LB...
CLOUDSTACK-7887	fail to push snapshot to secondary storage if using multipart using swift...
CLOUDSTACK-7886	cs:rabbitMQ:cloudstackoperations like deployvm,deleteNW are failing if CS fail ...
CLOUDSTACK-7884	Cloudstack MS is not responding (happening randomly) after some restart...
CLOUDSTACK-7877	The NET.IPRELEASE events are not added to usage_event on IP range deletion from ...
CLOUDSTACK-7872	One network incorrectly being shutdown ...
CLOUDSTACK-7871	Fix update VirtualMachine/Template API to allow nic/disk controller details for ...
CLOUDSTACK-7869	Add simulator support for findHostsForMigration API...
CLOUDSTACK-7855	Sec storage/network MTU should be on nic3 and not nic1...
CLOUDSTACK-7854	Delete redundant CentOS 5.3 buit-in template in case of XenServer since CentOS 5...
CLOUDSTACK-7843	sync Job Failures always reported as success on Event Bus ...
CLOUDSTACK-7842	wrong size column is getting updated with snapshot physical size in snapshot_sto...
CLOUDSTACK-7837	[UI] CIDR field not completely visible in multi-edit view...
CLOUDSTACK-7833	VM Async work jobs log “Was unable to find lock for the key vm_instance” errors ...
CLOUDSTACK-7832	MySQL deadlock occurred in resetting job_executing_msid of the completed vm work...
CLOUDSTACK-7830	Usage Job fails with “Data too long for column ‘user_name”’...
CLOUDSTACK-7829	Usage Job fails with “Data too long for column ‘user_name”’...
CLOUDSTACK-7822	test SSL cert expired...
CLOUDSTACK-7798	listing 2 guest networks is taking close to 4 seconds (Slow compare to previous ...
CLOUDSTACK-7797	listSupportedNetworkServices API takes more than 1 second to complete, slow comp...
CLOUDSTACK-7766	Field Validations Missing for Ingress and Egress Rules...
CLOUDSTACK-7765	Field Validations Missing for VPC IP Address Fields...
CLOUDSTACK-7764	No IP Address Validations when Adding Networks...
CLOUDSTACK-7749	AsyncJob GC thread cannot purge queue items that have been blocking for too long...
CLOUDSTACK-7730	Failed to create two icmp firewall rules...
CLOUDSTACK-7728	Network with egress policy allow, VR reboot missed default rule...
CLOUDSTACK-7722	add.label: Add button for tags show the label not “Add” text...
CLOUDSTACK-7720	No IP Address Validation for Acquire new secondary IP...
CLOUDSTACK-7718	No Field Validations on Zone Form...
CLOUDSTACK-7703	Cloudstack server endless loop when trying to create a volume while storage pool...

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Bug ID	Description
CLOUDSTACK-7700	Volume Snapshot Async Job returns Success for a failed operation...
CLOUDSTACK-7694	VMWare: Unable to create template from snapshots larger than 10G....
CLOUDSTACK-7688	Do not allow various operations which breaks VM Snapshots...
CLOUDSTACK-7679	bump up the RabbitMQ AMQP java client version from 2.8.7 to 3.3.5...
CLOUDSTACK-7639	cidrlist is not updated in the database after calling API updateNetworkACLItem...
CLOUDSTACK-7628	VM Worker job should be expunged one hour after completion instead of currently ...
CLOUDSTACK-7624	Long hostnames cause CloudStack to die with an encryption error during startup...
CLOUDSTACK-7595	Config parameters “job.expire.minutes” and “job.cancel.threshold.minutes” incorr...
CLOUDSTACK-7589	VM not Starting and always stuck in Stopped state after management server restar...
CLOUDSTACK-7581	Empty ‘ID’ parameters allowed in API calls...
CLOUDSTACK-7570	min and max iops are being processed null while creating a vm using third party ...
CLOUDSTACK-7566	Many jobs getting stuck in pending state and cloud is unusable...
CLOUDSTACK-7563	ClassCastException in VirtualMachineManagerImpl in handling various Agent comman...
CLOUDSTACK-7562	Details page for disk offerings only show details for write performance...
CLOUDSTACK-7553	Channel Closed error after SSVM and CPVM agents reconnect back to clustered mana...
CLOUDSTACK-7542	CreateNetworkCmd and CreateNetworkCmdByAdmin both have their own “vlan” paramete...
CLOUDSTACK-7540	S2SVpnConnections:CheckRouterTask is fails with NullPointer exception...
CLOUDSTACK-7538	Can not remove the vm nic due to there is another vm with same internal ip havin...
CLOUDSTACK-7536	user vm can get a gateway ip in case of shared network....
CLOUDSTACK-7528	When AlertManager fails to sendAlert it does not log the actual issue/error...
CLOUDSTACK-7517	FTP modules are not loaded in VR...
CLOUDSTACK-7482	Ajax calls in mgmt UI causing log pollution...
CLOUDSTACK-7468	NetScaler SSL Termination does not handle Projects as expected...
CLOUDSTACK-7463	UI: Domain Admin UI shows ‘Add LDAP Users’ button (should not be shown)...
CLOUDSTACK-7417	Admin cannot archive or delete events for a deleted account...
CLOUDSTACK-7412	Can’t create proper template from VM on S3 secondary storage environment...
CLOUDSTACK-7373	Incorrect Japanese keyboard mapping with CentOS CLI guestOS on VMware host...
CLOUDSTACK-7360	[vmware] Add host to existing cluster fails if the cluster is using Nexus 1000v ...
CLOUDSTACK-7344	VOLUME.DELETE usage event missing for VM’s in ERROR state...
CLOUDSTACK-7312	ISO/volume format name checking is crude and doesn’t work with advanced URLs...
CLOUDSTACK-7305	Hypervisor type parameter is mandatory when deploying VM using ISO...
CLOUDSTACK-7302	UI: Remove Hover Interaction from breadcrumbs at top page...
CLOUDSTACK-7293	UI: Validation message on login page is not user friendly...
CLOUDSTACK-7261	CLONE UI - listSystemVMs API and listRouters API fail to return hypervisor prope...
CLOUDSTACK-7260	Management server not responding after some time for Vmware due to Oom (cannot c...
CLOUDSTACK-7259	KVM mappings for CentOS 6.x and RHEL 6.x...
CLOUDSTACK-7250	[vCenter 5.5] SourceNAT,StaticNAT and Portfowrding is not working with Vmware DV...
CLOUDSTACK-7245	listIsos call does not return isdynamicallyscalable in the response attributes a...
CLOUDSTACK-7239	Wrong message thrown on Primary Storage addition failure in some cases...
CLOUDSTACK-7219	Cannot display Cluster Settings after 4.4 Upgrade...
CLOUDSTACK-7214	[LDAP] connection timeout is hardcoded to 500ms...
CLOUDSTACK-7200	[LDAP] importUsersCmd for a group fails incase any member of a group is not an u...
CLOUDSTACK-7191	On restartNetwork destroy the VR immediatley, instead of cleanup the rules then ...
CLOUDSTACK-7182	NPE while trying to deploy VMs in parallel in isolated network...
CLOUDSTACK-7175	Domain Id is exposed in error message when cross domain access is attempted when...
CLOUDSTACK-7162	queryAsyncJobResult api does not return jobinstanceid...
CLOUDSTACK-7153	addNicToVirtualMachine not BaseAsyncCreate but creates an entity...
CLOUDSTACK-7144	No GSLB provider is available during assigning load balancing rule...
CLOUDSTACK-7119	[VMware] Reset VM fails if there is a VM snapshot...

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Bug ID	Description
CLOUDSTACK-7118	Unable to expunge vms in error state...
CLOUDSTACK-7102	Volume migration fails with 'VM i-2-3-VM does not exist in VMware datacenter' ex...
CLOUDSTACK-7078	CLONE - [VMWARE]System VM's are failed to start with Nexus enabled Zone ...
CLOUDSTACK-7077	Quickly attaching multiple data disks to a VM fails...
CLOUDSTACK-7072	[VMware] Volume attachment intermittently fails with 'A specified parameter was ...
CLOUDSTACK-7071	Upgrade to 4.2 fails in case a VMware setup has multiple zones managing the same...
CLOUDSTACK-7069	[VMware] VM property 'numCoresPerSocket' is supported since vSphere API 5.0...
CLOUDSTACK-7068	addIpToNic not BaseAsyncCreate but creates an entity...
CLOUDSTACK-7062	Creating storage pool failing with xenserver with NullPointerException...
CLOUDSTACK-7030	VMWare Worker VMs left behind...
CLOUDSTACK-7023	[Automation] DeleteTagsCmd failed due to "Unable to find tags by parameters spec...
CLOUDSTACK-7012	[Atomation] Vcenter Hang during 4.4 automation runs...
CLOUDSTACK-7011	No logs being generated because Logs are created as root instead of cloud user...
CLOUDSTACK-7004	[Automation] [KVM] Deploying a VM with rootdisksize less than the size of templa...
CLOUDSTACK-6996	Adding cluster to legacy zone failed...
CLOUDSTACK-6990	VM console displays blank page.AgentControlChannelException in cloud.log...
CLOUDSTACK-6976	Support for "SecStorageFirewallCfgCommand" for simulator....
CLOUDSTACK-6945	Null pointer exception when starting a VM that had its template deleted...
CLOUDSTACK-6941	Can't choose storage for the volume, when attaching uploaded data volume to VM...
CLOUDSTACK-6940	Templates cannot be downloaded from URLs without matching file extensions...
CLOUDSTACK-6934	NPE at VolumeOrchestrator.java:868 during vm expunge when vm has volumes in Allo...
CLOUDSTACK-6929	HAPlanner gets added into the list of regular planners...
CLOUDSTACK-6919	CancelMaintenanceMode: when restart vms, don't attempt to restart user vm not ha...
CLOUDSTACK-6918	CancelStorageMaintenance: Not all vms get restarted as a part of canceling maint...
CLOUDSTACK-6915	Deleting dynamically added OS results in NPE for existing instances using that o...
CLOUDSTACK-6910	Phase 1: tagging of test cases...
CLOUDSTACK-6907	listVolumes: diskOfferingId is returned for the volume instead of service offeri...
CLOUDSTACK-6905	NPE XenServerGuru.java:95 when remove the nic from the vm in Stopped state...
CLOUDSTACK-6898	[Hyper-V] Open the console of a VM from CS, reboot the VM (from CS or from insi...
CLOUDSTACK-6892	Database HA Config prevents mgmt server from starting...
CLOUDSTACK-6886	Cannot add SDX Netscaler device...
CLOUDSTACK-6869	Public key content is overridden by template's meta data when you create a insta...
CLOUDSTACK-6840	[OVS][UI] Ovs provider should not be displayed in NetworkServiceProviders if the...
CLOUDSTACK-6821	Disk allocated for primary storage remain unchanged after volume deletion ...
CLOUDSTACK-6815	CallContext contains incorrect UUID for Account...
CLOUDSTACK-6787	Event Bus - Publishing uuids missing in some cases...
CLOUDSTACK-6740	Direct agent command throttling improvements...
CLOUDSTACK-6718	[OVS][UI] Isolated network offering (non-vpc) creation page shows ovs as the ser...
CLOUDSTACK-6691	NPE while assigning a VM nic primary/secondaryip to internal lb rule....
CLOUDSTACK-6690	[UI] ListView while assigning VM to internal LB rule in VPC is not valid....
CLOUDSTACK-6666	UI search for vm's in port forward rules field does not work...
CLOUDSTACK-6652	CLONE - [Automation] Vmware- System's StartCommand failed with "NumberFormatExc...
CLOUDSTACK-6631	unable to attach new Volume to VM...
CLOUDSTACK-6605	CLONE - [Automation] jasypt decryption error is thrown after restarting console ...
CLOUDSTACK-6594	Observed many DB Exception while starting MS "Can't DROP 'last_sent'; check that...
CLOUDSTACK-6579	used_bytes column of storage_pool table is no longer used and should be removed...
CLOUDSTACK-6576	No Error Handling while deploying GPU unsupported instances on a GPU enabled hos...
CLOUDSTACK-6570	API breakage of the UpdateUser API call...
CLOUDSTACK-6516	Default value of secstorage.encrypt.copy overridden...

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Bug ID	Description
CLOUDSTACK-6496	addHost fails for XenServer with vSwitch networking...
CLOUDSTACK-6495	JSVC package dependancy failures during installation of Cloudstack Agent on RHE...
CLOUDSTACK-6473	Debian 7 Virtual Router ip_conntrack_max not set at boot...
CLOUDSTACK-6467	User VM state listener publishes to event bus incompletely...
CLOUDSTACK-6465	vmware.reserve.mem is missing from cluster level settings ...
CLOUDSTACK-6459	Unable to enable maintenance mode on a Primary storage that crashed...
CLOUDSTACK-6445	Simulator enhancements...
CLOUDSTACK-6434	Enable redundant virtual router to configure interval for VRRP broadcast...
CLOUDSTACK-6433	Make sure redundant router would create a pair of routers when implementation...
CLOUDSTACK-6432	Prevent VR from response to DNS request from outside of network...
CLOUDSTACK-6376	listnetworkacls api when called with a networkid of a network which was created ...
CLOUDSTACK-6374	LB rules added while router reqiuires upgrade should be removed from lb vm map...
CLOUDSTACK-6371	KVM - secondary_storage count for account does not get incremted when snapshots ...
CLOUDSTACK-6358	Remove hardcoded guest OS mappings...
CLOUDSTACK-6337	Can't Migrate instance which use custom HA compute offering to another host...
CLOUDSTACK-6309	[Automation] Router deployment failed due to "aggregated command s execution fai...
CLOUDSTACK-6286	[Automation] VM deployment is failing in simulator...
CLOUDSTACK-6271	Integrate Deploy DB Into windows msi installer...
CLOUDSTACK-6228	Some action confirm dialogs show incorrect icon...
CLOUDSTACK-6212	'vm_instance' table has no AUTO_INCREMENT on 'id' field...
CLOUDSTACK-6177	CS does XS master switch, which may cause weird XS behavior...
CLOUDSTACK-6168	vm.instancename.flag inefficient...
CLOUDSTACK-6099	live migration is failing for vm deployed using dynaic compute offerings with NP...
CLOUDSTACK-6075	Increase the ram size for router service offering ...
CLOUDSTACK-6036	CloudStack stops the machine for no reason...
CLOUDSTACK-6004	Cannot do Local to Local Xen StorageMotion using XS6.2SP1...
CLOUDSTACK-5992	[Upgrade] default values of configuraiton parameters in configuration table are ...
CLOUDSTACK-5984	addvmwaredc API call is not documented ...
CLOUDSTACK-5952	[UI] VM ip address information is not shown after configuring static NAT...
CLOUDSTACK-5946	SSL: Fail to find the generated keystore. Loading fail-safe one to continue....
CLOUDSTACK-5910	mark the LDAP user as imported from LDAP...
CLOUDSTACK-5879	Document on how to use RabbitMq event bus with spring modularisation done in 4.3...
CLOUDSTACK-5853	cannot deploy vm with differing service storage tag and data disk storage tag...
CLOUDSTACK-5836	When tried to reverting back to (disk attached)quiesced vm snapshot, got error a...
CLOUDSTACK-5834	[upgrade]Error while collecting disk stats from : You gave an invalid object ref...
CLOUDSTACK-5824	Delete snapshot UI always success...
CLOUDSTACK-5809	Not able to deploy Vm becasue of crossing pool.storage.allocate d.capacity.disab...
CLOUDSTACK-5800	While creating a VM from template (which is created based on existing newly crea...
CLOUDSTACK-5700	[Vmsync] - kvm- "paused" state of Vm is not synced to CS....
CLOUDSTACK-5673	[Hyper-V] Default IP address never configured on eth0 with default CentOS templa...
CLOUDSTACK-5664	XEN patch/hotfix certification - after XS 6.0.2 XS602E030 patch installation VMs...
CLOUDSTACK-5641	Local disk usage on host don't show up in the admin's webui...
CLOUDSTACK-5578	KVM - Network down - When the host looses network connectivity , reboot stuck wh...
CLOUDSTACK-5576	RemoteVPNonVPC : Label needs to be changed to "Enable Remote Access VPN"...
CLOUDSTACK-5482	Vmware - When nfs was down for about 1 hour , when snapshots were in progress , ...
CLOUDSTACK-5469	Snapshot creation fails with following exception - "Failed to backup snapshot: q...
CLOUDSTACK-5446	KVM-Secondary Store down-Even after secondary store is brought back up after bei...
CLOUDSTACK-5395	When backup snapshot fails becasue of backup.snapshot.wait time exceeding , the ...
CLOUDSTACK-5359	Failed to add second VMWARE cluster on a standard vSwitch enabled zone when vCen...

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Bug ID	Description
CLOUDSTACK-5324	error message not proper when start VM fails because router requires upgrade...
CLOUDSTACK-5309	version number and requires upgrade fields are not displayed for routers when na...
CLOUDSTACK-5241	ROT13 usage...
CLOUDSTACK-4770	Management server fails to start with “Unable to get the management server node”...
CLOUDSTACK-4665	ceph:delete volume fails with ArrayIndexOutOfBoundsException...
CLOUDSTACK-4587	VM is failing to deploy on a Legacy zone after adding zone wide primary storage ...
CLOUDSTACK-4451	associateIPaddress requires zone id but apidoc says it’s optional...
CLOUDSTACK-4364	Restore VM - needs to log usage event for volume...
CLOUDSTACK-4351	[DOC] 4.3.2. Host/Hypervisor System Requirements has misleading or premature no...
CLOUDSTACK-4322	Delete domain with force option is not returning failed as response incase of ac...
CLOUDSTACK-4292	ceph:destroyedvm failed with ArrayIndexexception while expunging...
CLOUDSTACK-4200	listSystemVMs API and listRouters API fail to return hypervisor property ...
CLOUDSTACK-3995	No error notification is generated when Primary storage (Zonelevel) is added wit...
CLOUDSTACK-3815	“SNAPSHOT.CREATE” event’s states are not registered on the events table ...
CLOUDSTACK-3608	“guest_os_hypervisor” table has repeated mappings of hypervisor and guest OS...
CLOUDSTACK-3607	“guest_os_hypervisor” table has values that are not registered in “guest_os” tab...
CLOUDSTACK-2625	Duplicate usage records when listing large number of records...
CLOUDSTACK-1990	Docs: Update “Choosing a Hypervisor” feature matrix with new info...
CLOUDSTACK-315	Infrastructure view does not show capacity values...

CHAPTER 3

Compatibility Matrix

3.1 Supported OS Versions for Management Server

This section lists the operating systems that are supported for running CloudStack Management Server. Note that specific versions of the operating systems are tested, so compatibility with CentOS 6.3 may not indicate compatibility with CentOS 6.2, 6.1 and so on.

- RHEL versions 6.3, 6.5, 6.6 and 7.0
- CentOS versions 6.6, 7.0
- Ubuntu 14.04 LTS

3.1.1 Software Requirements

- Java 1.7
- MySQL 5.6 (RHEL 7)
- MySQL 5.1 (RHEL 6.x)

3.2 Supported Hypervisor Versions

CloudStack supports three hypervisor families, XenServer with XAPI, KVM, and VMware with vSphere.

- LXC Host Containers on RHEL 7
- Windows Server 2012 R2 (with Hyper-V Role enabled)
- Hyper-V 2012 R2
- CentOS 6.2+ with KVM
- Red Hat Enterprise Linux 6.2 with KVM
- XenServer versions 6.1, 6.2 SP1 and 6.5 with latest hotfixes
- VMware versions 5.0 Update 3a, 5.1 Update 2a, and 5.5 Update 2
- Bare metal hosts are supported, which have no hypervisor. These hosts can run the following operating systems:
  - RHEL or CentOS, v6.2 or 6.3

    Note: Use libvirt version 0.9.10 for CentOS 6.3

  - Fedora 17
  - Ubuntu 12.04

For more information, see the Hypervisor Compatibility Matrix in the CloudStack Installation Guide.

3.3 Supported External Devices

- Netscaler VPX and MPX versions 9.3, 10.1e and 10.5
- Netscaler SDX version 9.3, 10.1e and 10.5
- SRX (Model srx100b) versions 10.3 to 10.4 R7.5
- F5 11.X
- Force 10 Switch version S4810 for Baremetal Advanced Networks

3.4 Supported Browsers

The CloudStack Web-based UI should be compatible with any modern browser, but it's possible that some browsers will not render portions of the UI reliably, depending on their support of Web standards. For best results, one of the following browsers recommended:

- Internet Explorer versions 10 and 11
- Firefox version 31 or later
- Google Chrome version 36.0.1985
- Safari 6+

CHAPTER 4

API Changes Introduced in 4.5

For the complete list of API commands and params consult the CloudStack Apidocs.

4.1 Added API commands

API	Description
samlSso	SP initiated SAML Single Sign On
samlSlo	SAML Global Log Out API
getSPMetadata	Returns SAML2 CloudStack Service Provider MetaData
listHostTags	Lists host tags
listStorageTags	Lists storage tags
addBrocadeVcsDevice	Adds a Brocade VCS Switch
deleteBrocadeVcsDevice	delete a Brocade VCS Switch
listBrocadeVcsDevices	Lists Brocade VCS Switches
listBrocadeVcsDeviceNetworks	lists network that are using a brocade vcs switch
addNuageVspDevice	Adds a Nuage VSP device
deleteNuageVspDevice	delete a nuage vsp device
listNuageVspDevices	Lists Nuage VSP devices
issueNuageVspResourceRequest	Issues a Nuage VSP REST API resource request
getSolidFireAccountId	Get SolidFire Account ID
getSolidFireVolumeSize	Get the SF volume size including Hypervisor Snapshot Reserve
getSolidFireVolumeAccessGroupId	Get the SF Volume Access Group ID
getSolidFireVolumeIscsiName	Get SolidFire Volume's Iscsi Name
addBaremetalRct	adds baremetal rack configuration text
deleteBaremetalRct	deletes baremetal rack configuration text
listBaremetalRct	list baremetal rack configuration
createServiceInstance	Creates a system virtual-machine that implements network services
addOpenDaylightController	Adds an OpenDyalight controler
deleteOpenDaylightController	Removes an OpenDyalight controler
listOpenDaylightControllers	Lists OpenDyalight controllers
addGloboDnsHost	Adds the GloboDNS external host

4.2 Updated API commands

API	Description
reconnectHost	Response: New parameters: details
addHost	Response: New parameters: details
updateHost	Response: New parameters: details
cancelHostMaintenance	Response: New parameters: details
prepareHostForMaintenance	Response: New parameters: details
listHosts	Response: New parameters: details
listVolumes	Response: New parameters: provisioningtype
migrateVolume	Response: New parameters: provisioningtype
attachVolume	Response: New parameters: provisioningtype
updateVolume	Response: New parameters: provisioningtype
resizeVolume	Request: New parameters: `maxiops` (optional), `miniops` (optional) Response: New parameters: provisioningtype
detachVolume	Response: New parameters: provisioningtype
createVolume	Response: New parameters: provisioningtype
uploadVolume	Response: New parameters: provisioningtype
listUsageRecords	Request: New parameters: usageid (optional)

Continued on next page

Table 4.1 – continued from previous page

API	Description
updateTrafficType	Request: New parameters: `xenservernetworklabel` (optional) Removed parameters: xennetworklabel Response: New parameters: xenservernetworklabel Removed parameters: xennetworklabel
login	Response: New parameters: registered Removed parameters: password, timezone-offset
updateZone	Response: Removed parameters: vlan
createZone	Response: Removed parameters: vlan
listZones	Response: Removed parameters: vlan
listBaremetalPxeServers	Request: New parameters: `physicalnetworkid` (required)
listBaremetalDhcp	Request: New parameters: `physicalnetworkid` (required)
addBaremetalHost	Response: New parameters: details
addTrafficType	Request: New parameters: `xenservernetworklabel` (optional) Removed parameters: xennetworklabel Response: New parameters: xenservernetworklabel Removed parameters: xennetworklabel
listPublicIpAddresses	Request: New parameters: `state` (optional)
startInternalLoadBalancerVM	Response: New parameters: hypervisor
listExternalLoadBalancers	Response: New parameters: details

Continued on next page

Table 4.1 – continued from previous page

API	Description
listInternalLoadBalancerVMs	Response: New parameters: hypervisor
listLBHealthCheckPolicies	Request: Changed parameters: `lbruleid` (old version - optional, new version - required) Removed parameters: id
stopInternalLoadBalancerVM	Response: New parameters: hypervisor
updateVirtualMachine	Request: Changed parameters: `instancename` (optional)
createServiceOffering	Request: New parameters: `provisioningtype` (optional) Response: New parameters: provisioningtype
updateServiceOffering	Response: New parameters: provisioningtype
listServiceOfferings	Response: New parameters: provisioningtype
updateDiskOffering	Response: New parameters: provisioningtype
listDiskOfferings	Response: New parameters: provisioningtype
createDiskOffering	Request: New parameters: `provisioningtype` (optional) Response: New parameters: provisioningtype
listRouters	Response: New parameters: hypervisor
stopRouter	Response: New parameters: hypervisor
destroyRouter	Response: New parameters: hypervisor

Continued on next page

Table 4.1 – continued from previous page

API	Description
rebootRouter	Response: New parameters: hypervisor
startRouter	Response: New parameters: hypervisor
changeServiceForRouter	Response: New parameters: hypervisor
changeServiceForSystemVm	Response: New parameters: hypervisor
listSystemVms	Response: New parameters: hypervisor
destroySystemVm	Response: New parameters: hypervisor
stopSystemVm	Response: New parameters: hypervisor
startSystemVm	Response: New parameters: hypervisor
migrateSystemVm	Response: New parameters: hypervisor
rebootSystemVm	Response: New parameters: hypervisor
scaleSystemVm	Response: New parameters: hypervisor

CHAPTER 5

General Upgrade Notes

5.1 Job timeouts are shorter than before

Please be aware that in 4.5 a bug is fixed (CLOUDSTACK-7595) that makes sure global settings 'job.cancel.threshold.minutes' and 'job.expire.minutes' are defined in minutes as they are supposed to be. Before, they were accidentally 60x bigger than configured. This means previous versions had a much higher timeout. You might hit this timeout when migrating large disks or making big snapshots, etc.

5.2 Java version upgraded to Java 1.7

As of Apache CloudStack 4.4, Java version required is 1.7 for the management-server, cloudstack-usage, KVM agent and system-VMs.

5.3 Depreciation of realhostip.com

The realhostip.com dynamic DNS resolution service is being retired on September 30th, 2014. In advance of that, CloudStack 4.3 and later no longer uses realhostip.com DNS domains or SSL certificates to encrypt Console Proxy or file copy communications.

For latest update about realhostip.com follow Apache CloudStack Blog.

5.4 Settings Changes

After upgrading to 4.2 and later, Settings `mem.overporvisioning.factor` and `cpu.overporvisioning.factor` are now at the cluster level and be set to 1 which is the default.

If Global Settings `mem.overporvisioning.factor` and `cpu.overporvisioning.factor` have been changed prior the upgrade to 4.2 and later, the upgrade process will be reset them to 1. Values can be changed by editing clusters settings.

All clusters created after the upgrade will get created with the Global Settings values for `mem.overporvisioning.factor` and `cpu.overporvisioning.factor`.

5.5 OVS plug-in

OVS plug-in functionality is disrupted if ovsdaemon crashes

A critical functionality issue came out with CLOUDSTACK-6779. On XenServer it is observed that on VIF unplug Ovs-Vswitchd is crashing resulting in loosing all the openflow rules added to the bridge. Ovs daemon gets started and creates a bridge but configure openflow rules are lost resulting in the disruption of connectivity for the VM's on the host.

5.6 Active-Directory Authentication (LDAP)

If using Active-Directory (LDAP/LDAPs) as user authentication; Upgrading to 4.3 and later require changes in Global Settings. After upgrading CloudStack to 4.3 or latest, following Global Settings must be change:

Global Settings	Default	New
ldap.user.object	inetOrgPerson	user
ldap.username.attribute	uid	sAMAccountName

5.7 SystemVM 32bit deprecated

32bit versions of systemvm templates are in the process of behing deprecated. Upgrade instructions from this Release Notes use 64bit templates. 32bit systemvm-templates are available for this version on http://cloudstack.apt-get.eu/systemvm/4.4/. Follow the dev mailing list for further updates.

CHAPTER 6

Upgrade Instruction from 4.4.x

This section will guide you from CloudStack 4.4.x to CloudStack 4.5.

Any steps that are hypervisor-specific will be called out with a note.

We recommend reading through this section once or twice before beginning your upgrade procedure, and working through it on a test system before working on a production system.

Note: The following upgrade instructions should be performed regardless of hypervisor type.

Upgrade Steps:

1. Backup CloudStack database (MySQL)
2. Upgrade CloudStack management server(s)
3. Update hypervisors specific dependencies

6.1 Packages repository

Most users of CloudStack manage the installation and upgrades of CloudStack with one of Linux's predominant package systems, RPM or APT. This guide assumes you'll be using RPM and Yum (for Red Hat Enterprise Linux or CentOS), or APT and Debian packages (for Ubuntu).

Create RPM or Debian packages (as appropriate) and a repository from the 4.5 source, or check the Apache CloudStack downloads page at http://cloudstack.apache.org/downloads.html for package repositories supplied by community members. You will need them for *Management Server on Ubuntu* or *Management Server on CentOS/RHEL* and *Hypervisor: KVM* hosts upgrade.

Instructions for creating packages from the CloudStack source are in the CloudStack Installation Guide.

6.2 Update System-VM templates

1. While running the existing 4.4.x system, log in to the UI as root administrator.
2. In the left navigation bar, click Templates.
3. In Select view, click Templates.
4. Click Register template.

   The Register template dialog box is displayed.

5. In the Register template dialog box, specify the following values (do not change these):

Hypervisor	Description
XenServer	Name: systemvm-xenserver-4.5 Description: systemvm-xenserver-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-xen.vhd.bz2 Zone: Choose the zone where this hypervisor is used Hypervisor: XenServer Format: VHD OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
KVM	Name: systemvm-kvm-4.5 Description: systemvm-kvm-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-kvm.qcow2.bz2 Zone: Choose the zone where this hypervisor is used Hypervisor: KVM Format: QCOW2 OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
VMware	Name: systemvm-vmware-4.5 Description: systemvm-vmware-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-vmware.ova Zone: Choose the zone where this hypervisor is used Hypervisor: VMware Format: OVA OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
HyperV	Name: systemvm-hyperv-4.5 Description: systemvm-hyperv-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-hyperv.vhd.zip Zone: Choose the zone where this hypervisor is used Hypervisor: VMware Format: OVA OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no

6. Watch the screen to be sure that the template downloads successfully and enters the **READY** state. Do not proceed until this is successful.

6.3 Database Preparation

Backup current database

1. Stop your management server or servers. Run this on all management server hosts:

```
$ sudo service cloudstack-management stop
```

2. If you are running a usage server or usage servers, stop those as well:

```
$ sudo service cloudstack-usage stop
```

3. Make a backup of your MySQL database. If you run into any issues or need to roll back the upgrade, this will assist in debugging or restoring your existing environment. You'll be prompted for your password.

```
$ mysqldump -u root -p cloud > cloud-backup_`date '+%Y-%m-%d'`.sql
$ mysqldump -u root -p cloud_usage > cloud_usage-backup_`date '+%Y-%m-%d'`.sql
```

4. **(KVM Only)** If primary storage of type local storage is in use, the path for this storage needs to be verified to ensure it passes new validation. Check local storage by querying the cloud.storage_pool table:

```
$ mysql -u cloud -p -e "select id,name,path from cloud.storage_pool where pool_type='Filesystem'
```

If local storage paths are found to have a trailing forward slash, remove it:

```
$ mysql -u cloud -p -e 'update cloud.storage_pool set path="/var/lib/libvirt/images" where path=
```

6.4 Management Server on Ubuntu

If you are using Ubuntu, follow this procedure to upgrade your packages. If not, skip to step *Management Server on CentOS/RHEL*.

Note: Community Packages: This section assumes you're using the community supplied packages for CloudStack. If you've created your own packages and APT repository, substitute your own URL for the ones used in these examples.

The first order of business will be to change the sources list for each system with CloudStack packages. This means all management servers, and any hosts that have the KVM agent. (No changes should be necessary for hosts that are running VMware or Xen.)

6.4.1 CloudStack apt repository

Start by opening `/etc/apt/sources.list.d/cloudstack.list` on any systems that have CloudStack packages installed.

This file should have one line, which contains:

```
deb http://cloudstack.apt-get.eu/ubuntu precise 4.4
```

We'll change it to point to the new package repository:

```
deb http://packages.shapeblue.com/cloudstack/upstream/debian/4.5/ ./
```

Setup the public key for the above repository:

```
wget -qO - http://packages.shapeblue.com/release.asc | sudo apt-key add -
```

If you're using your own package repository, change this line to read as appropriate for your 4.5 repository.

1. Now update your apt package list:

```
$ sudo apt-get update
```

2. Now that you have the repository configured, it's time to upgrade the `cloudstack-management` package.

```
$ sudo apt-get upgrade cloudstack-management
```

3. If you use CloudStack usage server

```
$ sudo apt-get upgrade cloudstack-usage
```

6.5 Management Server on CentOS/RHEL

If you are using CentOS or RHEL, follow this procedure to upgrade your packages. If not, skip to hypervisors section, then *System-VMs and Virtual-Routers*.

Note: Community Packages: This section assumes you're using the community supplied packages for CloudStack. If you've created your own packages and yum repository, substitute your own URL for the ones used in these examples.

6.5.1 CloudStack RPM repository

The first order of business will be to change the yum repository for each system with CloudStack packages. This means all management servers, and any hosts that have the KVM agent.

(No changes should be necessary for hosts that are running VMware or Xen.)

Start by opening `/etc/yum.repos.d/cloudstack.repo` on any systems that have CloudStack packages installed.

This file should have content similar to the following:

```
[apache-cloudstack]
name=Apache CloudStack
baseurl=http://cloudstack.apt-get.eu/rhel/4.4/
enabled=1
gpgcheck=0
```

If you are using the community provided package repository, change the base url to `http://packages.shapeblue.com/cloudstack/upstream/centos/4.5/` If you want to use the CentOS7 repository use the url `http://packages.shapeblue.com/cloudstack/upstream/centos7/4.5/`

Setup the GPG public key if you wish to enable `gpgcheck=1`:

```
wget http://packages.shapeblue.com/release.asc
rpm --import release.asc
```

If you're using your own package repository, change this line to read as appropriate for your 4.5 repository.

1. Now that you have the repository configured, it's time to upgrade the `cloudstack-management`.

```
$ sudo yum upgrade cloudstack-management
```

2. If you use CloudStack usage server

```
$ sudo yum upgrade cloudstack-usage
```

6.6 Hypervisor: XenServer

(XenServer only) Copy vhd-utils file on CloudStack management servers. Copy the file vhd-utils to `/usr/share/cloudstack-common/scripts/vm/hypervisor/xenserver`.

```
wget -P /usr/share/cloudstack-common/scripts/vm/hypervisor/xenserver \
http://download.cloud.com.s3.amazonaws.com/tools/vhd-util
```

6.7 Hypervisor: VMware

Warning: For VMware hypervisor CloudStack management server packages must be build using "noredist". Refer to Building from Source.

(VMware only) Additional steps are required for each VMware cluster. These steps will not affect running guests in the cloud. These steps are required only for clouds using VMware clusters:

1. Stop the Management Server:

```
$ sudo service cloudstack-management stop
```

2. Generate the encrypted equivalent of your vCenter password:

```
$ java -classpath /usr/share/cloudstack-common/lib/jasypt-1.9.0.jar org.jasypt.intf.cli.JasyptPB
```

   Store the output from this step, we need to add this in cluster_details table and vmware_data_center tables in place of the plain text password

3. Find the ID of the row of cluster_details table that you have to update:

```
$ mysql -u <username> -p<password>
```

```
select * from cloud.cluster_details;
```

4. Update the plain text password with the encrypted one

```
update cloud.cluster_details set value = '_ciphertext_from_step_1_' where id = _id_from_step_2_;
```

5. Confirm that the table is updated:

```
select * from cloud.cluster_details;
```

6. Find the ID of the correct row of vmware_data_center that you want to update

```
select * from cloud.vmware_data_center;
```

7. update the plain text password with the encrypted one:

```
update cloud.vmware_data_center set password = '_ciphertext_from_step_1_' where id = _id_from_st
```

8. Confirm that the table is updated:

```
select * from cloud.vmware_data_center;
```

6.8 Hypervisor: KVM

6.8.1 KVM on Ubuntu

(KVM only) Additional steps are required for each KVM host. These steps will not affect running guests in the cloud. These steps are required only for clouds using KVM as hosts and only on the KVM hosts.

1. Configure the *CloudStack apt repository* as detailed above.
2. Stop the running agent.

```
$ sudo service cloudstack-agent stop
```

3. Update the agent software.

```
$ sudo apt-get upgrade cloudstack-agent
```

4. Verify that the file `/etc/cloudstack/agent/environment.properties` has a line that reads:

```
paths.script=/usr/share/cloudstack-common
```

   If not, add the line.

5. Start the agent.

```
$ sudo service cloudstack-agent start
```

6.8.2 KVM on CentOS/RHEL

For KVM hosts, upgrade the `cloudstack-agent` package

1. Configure the *CloudStack RPM repository* as detailed above.

```
$ sudo yum upgrade cloudstack-agent
```

2. Verify that the file `/etc/cloudstack/agent/environment.properties` has a line that reads:

```
paths.script=/usr/share/cloudstack-common
```

   If not, add the line.

3. Restart the agent:

```
$ sudo service cloudstack-agent stop
$ sudo killall jsvc
$ sudo service cloudstack-agent start
```

6.9 Restart management services

1. If upgrading fresh installation of 4.4.0

   If you are upgrading fresh installation of CloudStack 4.4.0, the following MySQL command must be executed before restarting the management server. If the system was running pre 4.4 and then upgraded to 4.4.0, the MySQL command is not required. Refer to: CLOUDSTACK-7813

```
use cloud;
ALTER TABLE `snapshot_policy` ADD `display` TINYINT( 1 ) NOT NULL DEFAULT '1';
```

2. Now it's time to start the management server

```
$ sudo service cloudstack-management start
```

3. If you use it, start the usage server

```
$ sudo service cloudstack-usage start
```

6.10 System-VMs and Virtual-Routers

Once you've upgraded the packages on your management servers, you'll need to restart the system VMs. Ensure that the admin port is set to 8096 by using the "integration.api.port" global parameter. This port is used by the cloud-sysvmadm script at the end of the upgrade procedure. For information about how to set this parameter, see Setting Global Configuration Parameters in the Installation Guide. Changing this parameter will require management server restart. Also make sure port 8096 is open in your local host firewall to do this.

There is a script that will do this for you, all you need to do is run the script and supply the IP address for your MySQL instance and your MySQL credentials:

```
# nohup cloudstack-sysvmadm -d IPaddress -u cloud -p password -a > sysvm.log 2>&1 &
```

You can monitor the log for progress. The process of restarting the system VMs can take an hour or more.

```
# tail -f sysvm.log
```

The output to `sysvm.log` will look something like this:

```
Stopping and starting 1 secondary storage vm(s)...
Done stopping and starting secondary storage vm(s)
Stopping and starting 1 console proxy vm(s)...
Done stopping and starting console proxy vm(s).
Stopping and starting 4 running routing vm(s)...
Done restarting router(s).
```

CHAPTER 7

Upgrade Instruction from 4.3.x

This section will guide you from CloudStack 4.3.x to CloudStack 4.5.

Any steps that are hypervisor-specific will be called out with a note.

We recommend reading through this section once or twice before beginning your upgrade procedure, and working through it on a test system before working on a production system.

Note: The following upgrade instructions should be performed regardless of hypervisor type.

Upgrade Steps:

1. Backup CloudStack database (MySQL)
2. Upgrade CloudStack management server(s)
3. Update hypervisors specific dependencies

7.1 Packages repository

Most users of CloudStack manage the installation and upgrades of CloudStack with one of Linux's predominant package systems, RPM or APT. This guide assumes you'll be using RPM and Yum (for Red Hat Enterprise Linux or CentOS), or APT and Debian packages (for Ubuntu).

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Instructions for creating packages from the CloudStack source are in the CloudStack Installation Guide.

7.2 Update System-VM templates

1. While running the existing 4.3.x system, log in to the UI as root administrator.
2. In the left navigation bar, click Templates.
3. In Select view, click Templates.
4. Click Register template.

   The Register template dialog box is displayed.

5. In the Register template dialog box, specify the following values (do not change these):

Hypervisor	Description
XenServer	Name: systemvm-xenserver-4.5 Description: systemvm-xenserver-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-xen.vhd.bz2 Zone: Choose the zone where this hypervisor is used Hypervisor: XenServer Format: VHD OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
KVM	Name: systemvm-kvm-4.5 Description: systemvm-kvm-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-kvm.qcow2.bz2 Zone: Choose the zone where this hypervisor is used Hypervisor: KVM Format: QCOW2 OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
VMware	Name: systemvm-vmware-4.5 Description: systemvm-vmware-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-vmware.ova Zone: Choose the zone where this hypervisor is used Hypervisor: VMware Format: OVA OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
HyperV	Name: systemvm-hyperv-4.5 Description: systemvm-hyperv-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-hyperv.vhd.zip Zone: Choose the zone where this hypervisor is used Hypervisor: VMware Format: OVA OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no

6. Watch the screen to be sure that the template downloads successfully and enters the **READY** state. Do not proceed until this is successful.

7.3 Database Preparation

Backup current database

1. Stop your management server or servers. Run this on all management server hosts:

```
$ sudo service cloudstack-management stop
```

2. If you are running a usage server or usage servers, stop those as well:

```
$ sudo service cloudstack-usage stop
```

3. Make a backup of your MySQL database. If you run into any issues or need to roll back the upgrade, this will assist in debugging or restoring your existing environment. You'll be prompted for your password.

```
$ mysqldump -u root -p cloud > cloud-backup_`date '+%Y-%m-%d'`.sql
$ mysqldump -u root -p cloud_usage > cloud_usage-backup_`date '+%Y-%m-%d'`.sql
```

4. **(KVM Only)** If primary storage of type local storage is in use, the path for this storage needs to be verified to ensure it passes new validation. Check local storage by querying the cloud.storage_pool table:

```
$ mysql -u cloud -p -e "select id,name,path from cloud.storage_pool where pool_type='Filesystem'
```

   If local storage paths are found to have a trailing forward slash, remove it:

```
$ mysql -u cloud -p -e 'update cloud.storage_pool set path="/var/lib/libvirt/images" where path=
```

7.4 Management Server on Ubuntu

If you are using Ubuntu, follow this procedure to upgrade your packages. If not, skip to step *Management Server on CentOS/RHEL*.

Note: Community Packages: This section assumes you're using the community supplied packages for CloudStack. If you've created your own packages and APT repository, substitute your own URL for the ones used in these examples.

The first order of business will be to change the sources list for each system with CloudStack packages. This means all management servers, and any hosts that have the KVM agent. (No changes should be necessary for hosts that are running VMware or Xen.)

7.4.1 CloudStack apt repository

Start by opening `/etc/apt/sources.list.d/cloudstack.list` on any systems that have CloudStack packages installed.

This file should have one line, which contains:

```
deb http://cloudstack.apt-get.eu/ubuntu precise 4.3
```

We'll change it to point to the new package repository:

```
deb http://packages.shapeblue.com/cloudstack/upstream/debian/4.5/ ./
```

Setup the public key for the above repository:

```
wget -qO - http://packages.shapeblue.com/release.asc | sudo apt-key add -
```

If you're using your own package repository, change this line to read as appropriate for your 4.5 repository.

1. Now update your apt package list:

```
$ sudo apt-get update
```

2. Now that you have the repository configured, it's time to upgrade the `cloudstack-management` package.

```
$ sudo apt-get upgrade cloudstack-management
```

3. If you use CloudStack usage server

```
$ sudo apt-get upgrade cloudstack-usage
```

7.5 Management Server on CentOS/RHEL

If you are using CentOS or RHEL, follow this procedure to upgrade your packages. If not, skip to hypervisors section, then *System-VMs and Virtual-Routers*.

Note: Community Packages: This section assumes you're using the community supplied packages for CloudStack. If you've created your own packages and yum repository, substitute your own URL for the ones used in these examples.

7.5.1 CloudStack RPM repository

The first order of business will be to change the yum repository for each system with CloudStack packages. This means all management servers, and any hosts that have the KVM agent.

(No changes should be necessary for hosts that are running VMware or Xen.)

Start by opening `/etc/yum.repos.d/cloudstack.repo` on any systems that have CloudStack packages installed.

This file should have content similar to the following:

```
[apache-cloudstack]
name=Apache CloudStack
baseurl=http://cloudstack.apt-get.eu/rhel/4.3/
enabled=1
gpgcheck=0
```

If you are using the community provided package repository, change the base url to `http://packages.shapeblue.com/cloudstack/upstream/centos/4.5/` If you want to use the CentOS7 repository use the url `http://packages.shapeblue.com/cloudstack/upstream/centos7/4.5/`

Setup the GPG public key if you wish to enable `gpgcheck=1`:

```
wget http://packages.shapeblue.com/release.asc
rpm --import release.asc
```

If you're using your own package repository, change this line to read as appropriate for your 4.5 repository.

1. Now that you have the repository configured, it's time to upgrade the `cloudstack-management`.

```
$ sudo yum upgrade cloudstack-management
```

2. If you use CloudStack usage server

```
$ sudo yum upgrade cloudstack-usage
```

7.6 Hypervisor: XenServer

(XenServer only) Copy vhd-utils file on CloudStack management servers. Copy the file vhd-utils to `/usr/share/cloudstack-common/scripts/vm/hypervisor/xenserver`.

```
wget -P /usr/share/cloudstack-common/scripts/vm/hypervisor/xenserver \
http://download.cloud.com.s3.amazonaws.com/tools/vhd-util
```

7.7 Hypervisor: VMware

Warning: For VMware hypervisor CloudStack management server packages must be build using "noredist". Refer to Building from Source.

(VMware only) Additional steps are required for each VMware cluster. These steps will not affect running guests in the cloud. These steps are required only for clouds using VMware clusters:

1. Stop the Management Server:

```
$ sudo service cloudstack-management stop
```

2. Generate the encrypted equivalent of your vCenter password:

```
$ java -classpath /usr/share/cloudstack-common/lib/jasypt-1.9.0.jar org.jasypt.intf.cli.JasyptPB
```

   Store the output from this step, we need to add this in cluster_details table and vmware_data_center tables in place of the plain text password

3. Find the ID of the row of cluster_details table that you have to update:

```
$ mysql -u <username> -p<password>
```

```
select * from cloud.cluster_details;
```

4. Update the plain text password with the encrypted one

```
update cloud.cluster_details set value = '_ciphertext_from_step_1_' where id = _id_from_step_2_;
```

5. Confirm that the table is updated:

```
select * from cloud.cluster_details;
```

6. Find the ID of the correct row of vmware_data_center that you want to update

```
select * from cloud.vmware_data_center;
```

7. update the plain text password with the encrypted one:

```
update cloud.vmware_data_center set password = '_ciphertext_from_step_1_' where id = _id_from_st
```

8. Confirm that the table is updated:

```
select * from cloud.vmware_data_center;
```

7.8 Hypervisor: KVM

7.8.1 KVM on Ubuntu

(KVM only) Additional steps are required for each KVM host. These steps will not affect running guests in the cloud. These steps are required only for clouds using KVM as hosts and only on the KVM hosts.

1. Configure the *CloudStack apt repository* as detailed above.
2. Stop the running agent.

```
$ sudo service cloudstack-agent stop
```

3. Update the agent software.

```
$ sudo apt-get upgrade cloudstack-agent
```

4. Verify that the file `/etc/cloudstack/agent/environment.properties` has a line that reads:

```
paths.script=/usr/share/cloudstack-common
```

   If not, add the line.

5. Start the agent.

```
$ sudo service cloudstack-agent start
```

7.8.2 KVM on CentOS/RHEL

For KVM hosts, upgrade the `cloudstack-agent` package

1. Configure the *CloudStack RPM repository* as detailed above.

```
$ sudo yum upgrade cloudstack-agent
```

2. Verify that the file `/etc/cloudstack/agent/environment.properties` has a line that reads:

```
paths.script=/usr/share/cloudstack-common
```

   If not, add the line.

3. Restart the agent:

```
$ sudo service cloudstack-agent stop
$ sudo killall jsvc
$ sudo service cloudstack-agent start
```

7.9 Restart management services

1. Now it's time to start the management server

```
$ sudo service cloudstack-management start
```

2. If you use it, start the usage server

```
$ sudo service cloudstack-usage start
```

7.10 System-VMs and Virtual-Routers

Once you've upgraded the packages on your management servers, you'll need to restart the system VMs. Ensure that the admin port is set to 8096 by using the "integration.api.port" global parameter. This port is used by the cloud-sysvmadm script at the end of the upgrade procedure. For information about how to set this parameter, see Setting Global Configuration Parameters in the Installation Guide. Changing this parameter will require management server restart. Also make sure port 8096 is open in your local host firewall to do this.

There is a script that will do this for you, all you need to do is run the script and supply the IP address for your MySQL instance and your MySQL credentials:

```
# nohup cloudstack-sysvmadm -d IPaddress -u cloud -p password -a > sysvm.log 2>&1 &
```

You can monitor the log for progress. The process of restarting the system VMs can take an hour or more.

```
# tail -f sysvm.log
```

The output to `sysvm.log` will look something like this:

```
Stopping and starting 1 secondary storage vm(s)...
Done stopping and starting secondary storage vm(s)
Stopping and starting 1 console proxy vm(s)...
Done stopping and starting console proxy vm(s).
Stopping and starting 4 running routing vm(s)...
Done restarting router(s).
```

CHAPTER 8

Upgrade Instruction from 4.2.x

This section will guide you from CloudStack 4.2.x to CloudStack 4.5.

If you run into any issues during upgrades, please feel free to ask questions on users@cloudstack.apache.org or dev@cloudstack.apache.org.

Warning: Depreciation of realhostip.com DNS and SSL certificate
The realhostip.com dynamic DNS resolution service is being retired this summer. In advance of that, CloudStack 4.3 and later no longer uses realhostip.com DNS domains or SSL certificates to encrypt Console Proxy or file copy communications.

Any steps that are hypervisor-specific will be called out with a note.

We recommend reading through this section once or twice before beginning your upgrade procedure, and working through it on a test system before working on a production system.

Note: The following upgrade instructions should be performed regardless of hypervisor type.

Upgrade Steps:

1. Install new System-VM templates
2. Backup CloudStack database (MySQL)
3. Upgrade CloudStack management server(s)
4. Update hypervisors specific dependencies
5. Restart System-VMs and Virtual-Routers

8.1 Packages repository

Most users of CloudStack manage the installation and upgrades of CloudStack with one of Linux's predominant package systems, RPM or APT. This guide assumes you'll be using RPM and Yum (for Red Hat Enterprise Linux or CentOS), or APT and Debian packages (for Ubuntu).

Create RPM or Debian packages (as appropriate) and a repository from the 4.5 source, or check the Apache CloudStack downloads page at http://cloudstack.apache.org/downloads.html for package repositories supplied by community members. You will need them for *Management Server Ubuntu* or *Management Server CentOS/RHEL* and *Hypervisor: KVM* hosts upgrade.

Instructions for creating packages from the CloudStack source are in the CloudStack Installation Guide.

8.2 Update System-VM templates

1. While running the existing 4.2.x system, log in to the UI as root administrator.
2. In the left navigation bar, click Templates.
3. In Select view, click Templates.
4. Click Register template.

   The Register template dialog box is displayed.
5. In the Register template dialog box, specify the following values (do not change these):

Hypervisor	Description
XenServer	Name: systemvm-xenserver-4.5 Description: systemvm-xenserver-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-xen.vhd.bz2 Zone: Choose the zone where this hypervisor is used Hypervisor: XenServer Format: VHD OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
KVM	Name: systemvm-kvm-4.5 Description: systemvm-kvm-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-kvm.qcow2.bz2 Zone: Choose the zone where this hypervisor is used Hypervisor: KVM Format: QCOW2 OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
VMware	Name: systemvm-vmware-4.5 Description: systemvm-vmware-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-vmware.ova Zone: Choose the zone where this hypervisor is used Hypervisor: VMware Format: OVA OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no
HyperV	Name: systemvm-hyperv-4.5 Description: systemvm-hyperv-4.5 URL: http://packages.shapeblue.com/systemvmtemplate/4.5/systemvm64template-4.5-hyperv.vhd.zip Zone: Choose the zone where this hypervisor is used Hypervisor: VMware Format: OVA OS Type: Debian GNU/Linux 7.0 (64-bit) (or the highest Debian release number available in the dropdown) Extractable: no Password Enabled: no Public: no Featured: no Routing: no

6. Watch the screen to be sure that the template downloads successfully and enters the **READY** state. Do not proceed until this is successful.

8.3 Database Preparation

Backup current database

1. Stop your management server or servers. Run this on all management server hosts:

```
$ sudo service cloudstack-management stop
```

2. If you are running a usage server or usage servers, stop those as well:

```
$ sudo service cloudstack-usage stop
```

3. Make a backup of your MySQL database. If you run into any issues or need to roll back the upgrade, this will assist in debugging or restoring your existing environment. You'll be prompted for your password.

```
$ mysqldump -u root -p cloud > cloud-backup_`date '+%Y-%m-%d'`.sql
$ mysqldump -u root -p cloud_usage > cloud_usage-backup_`date '+%Y-%m-%d'`.sql
```

4. **(KVM Only)** If primary storage of type local storage is in use, the path for this storage needs to be verified to ensure it passes new validation. Check local storage by querying the cloud.storage_pool table:

```
$ mysql -u cloud -p -e "select id,name,path from cloud.storage_pool where pool_type='Filesystem'
```

If local storage paths are found to have a trailing forward slash, remove it:

```
$ mysql -u cloud -p -e 'update cloud.storage_pool set path="/var/lib/libvirt/images" where path=
```

8.4 Management Server Ubuntu

If you are using Ubuntu, follow this procedure to upgrade your packages. If not, skip to step *Management Server CentOS/RHEL*.

Note: Community Packages: This section assumes you're using the community supplied packages for CloudStack. If you've created your own packages and APT repository, substitute your own URL for the ones used in these examples.

The first order of business will be to change the sources list for each system with CloudStack packages. This means all management servers, and any hosts that have the KVM agent. (No changes should be necessary for hosts that are running VMware or Xen.)

8.4.1 CloudStack apt repository

Start by opening `/etc/apt/sources.list.d/cloudstack.list` on any systems that have CloudStack packages installed.

This file should have one line, which contains:

```
deb http://cloudstack.apt-get.eu/ubuntu precise 4.2
```

We'll change it to point to the new package repository:

```
deb http://packages.shapeblue.com/cloudstack/upstream/debian/4.5/ ./
```

Setup the public key for the above repository:

```
wget -qO - http://packages.shapeblue.com/release.asc | sudo apt-key add -
```

If you're using your own package repository, change this line to read as appropriate for your 4.5 repository.

1. Now update your apt package list:

```
$ sudo apt-get update
```

2. Now that you have the repository configured, it's time to upgrade the `cloudstack-management` package.

```
$ sudo apt-get upgrade cloudstack-management
```

3. If you use CloudStack usage server

```
$ sudo apt-get upgrade cloudstack-usage
```

8.5 Management Server CentOS/RHEL

If you are using CentOS or RHEL, follow this procedure to upgrade your packages. If not, skip to hypervisors section, then *System-VMs and Virtual-Routers*.

Note: Community Packages: This section assumes you're using the community supplied packages for CloudStack. If you've created your own packages and yum repository, substitute your own URL for the ones used in these examples.

8.5.1 CloustStack RPM repository

The first order of business will be to change the yum repository for each system with CloudStack packages. This means all management servers, and any hosts that have the KVM agent.

(No changes should be necessary for hosts that are running VMware or Xen.)

Start by opening `/etc/yum.repos.d/cloudstack.repo` on any systems that have CloudStack packages installed.

This file should have content similar to the following:

```
[apache-cloudstack]
name=Apache CloudStack
baseurl=http://cloudstack.apt-get.eu/rhel/4.2/
enabled=1
gpgcheck=0
```

If you are using the community provided package repository, change the base url to `http://packages.shapeblue.com/cloudstack/upstream/centos/4.5/` If you want to use the CentOS7 repository use the url `http://packages.shapeblue.com/cloudstack/upstream/centos7/4.5/`

Setup the GPG public key if you wish to enable `gpgcheck=1`:

```
wget http://packages.shapeblue.com/release.asc
rpm --import release.asc
```

If you're using your own package repository, change this line to read as appropriate for your 4.5 repository.

1. Now that you have the repository configured, it's time to upgrade the `cloudstack-management`.

```
$ sudo yum upgrade cloudstack-management
```

2. If you use CloudStack usage server

```
$ sudo yum upgrade cloudstack-usage
```

8.6 Hypervisor: Xen/XenServer

(XenServer only) Copy vhd-utils file on CloudStack management servers. Copy the file vhd-utils to `/usr/share/cloudstack-common/scripts/vm/hypervisor/xenserver`.

```
wget -P /usr/share/cloudstack-common/scripts/vm/hypervisor/xenserver \
http://download.cloud.com.s3.amazonaws.com/tools/vhd-util
```

8.7 Hypervisor: VMware

Warning: For VMware hypervisor CloudStack management server packages must be build using "noredist". Refer to Building from Source.

(VMware only) Additional steps are required for each VMware cluster. These steps will not affect running guests in the cloud. These steps are required only for clouds using VMware clusters:

1. Stop the Management Server:

```
$ sudo service cloudstack-management stop
```

2. Generate the encrypted equivalent of your vCenter password:

```
$ java -classpath /usr/share/cloudstack-common/lib/jasypt-1.9.0.jar org.jasypt.intf.cli.JasyptPB
```

   Store the output from this step, we need to add this in cluster_details table and vmware_data_center tables in place of the plain text password

3. Find the ID of the row of cluster_details table that you have to update:

```
$ mysql -u <username> -p<password>
```

```
select * from cloud.cluster_details;
```

4. Update the plain text password with the encrypted one

```
update cloud.cluster_details set value = '_ciphertext_from_step_1_' where id = _id_from_step_2_;
```

5. Confirm that the table is updated:

```
select * from cloud.cluster_details;
```

6. Find the ID of the correct row of vmware_data_center that you want to update

```
select * from cloud.vmware_data_center;
```

7. Update the plain text password with the encrypted one:

```
update cloud.vmware_data_center set password = '_ciphertext_from_step_1_' where id = _id_from_st
```

8. Confirm that the table is updated:

```
select * from cloud.vmware_data_center;
```

8.8 Hypervisor: KVM

8.8.1 KVM on Ubuntu

(KVM only) Additional steps are required for each KVM host. These steps will not affect running guests in the cloud. These steps are required only for clouds using KVM as hosts and only on the KVM hosts.

1. Configure the *CloudStack apt repository* as detailed above.
2. Stop the running agent.

```
$ sudo service cloudstack-agent stop
```

3. Update the agent software.

```
$ sudo apt-get upgrade cloudstack-agent
```

4. Verify that the file `/etc/cloudstack/agent/environment.properties` has a line that reads:

```
paths.script=/usr/share/cloudstack-common
```

   If not, add the line.

5. Start the agent.

```
$ sudo service cloudstack-agent start
```

8.8.2 KVM on CentOS/RHEL

For KVM hosts, upgrade the `cloudstack-agent` package

1. Configure the *CloustStack RPM repository* as detailed above.

```
$ sudo yum upgrade cloudstack-agent
```

2. Verify that the file `/etc/cloudstack/agent/environment.properties` has a line that reads:

```
paths.script=/usr/share/cloudstack-common
```

   If not, add the line.

3. Restart the agent:

```
$ sudo service cloudstack-agent stop
$ sudo killall jsvc
$ sudo service cloudstack-agent start
```

8.9 Restart management services

1. Now it's time to start the management server

```
$ sudo service cloudstack-management start
```

2. If you use it, start the usage server

```
$ sudo service cloudstack-usage start
```

8.10 System-VMs and Virtual-Routers

Once you've upgraded the packages on your management servers, you'll need to restart the system VMs. Ensure that the admin port is set to 8096 by using the "integration.api.port" global parameter. This port is used by the cloud-sysvmadm script at the end of the upgrade procedure. For information about how to set this parameter, see Setting Global Configuration Parameters in the Installation Guide. Changing this parameter will require management server restart. Also make sure port 8096 is open in your local host firewall to do this.

There is a script that will do this for you, all you need to do is run the script and supply the IP address for your MySQL instance and your MySQL credentials:

```
# nohup cloudstack-sysvmadm -d IPaddress -u cloud -p password -a > sysvm.log 2>&1 &
```

You can monitor the log for progress. The process of restarting the system VMs can take an hour or more.

```
# tail -f sysvm.log
```

The output to `sysvm.log` will look something like this:

```
Stopping and starting 1 secondary storage vm(s)...
Done stopping and starting secondary storage vm(s)
Stopping and starting 1 console proxy vm(s)...
Done stopping and starting console proxy vm(s).
Stopping and starting 4 running routing vm(s)...
Done restarting router(s).
```

CHAPTER 9

Validate 4.5 source code tarball

1. Perform the following to verify the artifacts:

   (a) (optional) Install GPG keys if needed:

```
$ sudo apt-get install gpg
```

   (b) Import the GPG keys stored in the source distribution's KEYS file

```
$ gpg --import KEYS
```

   Alternatively, download the signing keys, the IDs found in the KEYS file, individually by using a keyserver.

   For example:

```
$ gpg --recv-keys CC56CEA8
```

   (c) Verify signatures and hash files:

```
$ gpg --verify apache-cloudstack-4.5-src.tar.bz2.asc
$ gpg --print-md MD5 apache-cloudstack-4.5-src.tar.bz2 | diff - apache-cloudstack-4.5-src.ta
$ gpg --print-md SHA512 apache-cloudstack-4.5-src.tar.bz2 | diff - apache-cloudstack-4.5-src
```

   Each of these commands should return no output. Any output from them implies that there is a difference between the hash you generated locally and the hash that has been pulled from the server.

   (d) Get the commit hash from the VOTE email.

   For example: `4cd60f3d1683a3445c3248f48ae064fb573db2a1`. The value changes between releases.

   (e) Create two new temporary directories:

```
$ mkdir /tmp/cloudstack/git
$ mkdir /tmp/cloudstack/tree
```

   (f) Check out the 4.5 branch:

```
$ git clone https://git-wip-us.apache.org/repos/asf/cloudstack.git /tmp/cloudstack/git
$ cd /tmp/cloudstack/git
$ git archive --format=tar --prefix=/tmp/cloudstack/tree/ <commit-hash> | tar Pxf -
```

   (g) Unpack the release artifact:

```
$ cd /tmp/cloudstack
$ tar xvfj apache-cloudstack-4.5-src.tar.bz2
```

(h) Compare the contents of the release artifact with the contents pulled from the repo:

```
$ diff -r /tmp/cloudstack/apache-cloudstack-4.5-src /tmp/cloudstack/tree
```

Ensure that content is the same.

(i) Verify the Code License Headers:

```
$ cd /tmp/cloudstack/apache-cloudstack-4.5-src
$ mvn --projects='org.apache.cloudstack:cloudstack' org.apache.rat:apache-rat-plugin:0.8:che
```

The build fails if any non-compliant files are present that are not specifically excluded from the ASF license header requirement. You can optionally review the target/rat.txt file after the run completes. Passing the build implies that RAT certifies that the files are compliant and this test is passed.

CHAPTER 10

Known Issues in 4.5.1

Apache CloudStack uses Jira to track its issues. All new features and bugs for 4.5.1 have been tracked in Jira, and have a standard naming convention of "CLOUDSTACK-NNNN" where "NNNN" is the issue number.

For the list of known issues, see Known Issues in 4.5.1.

Bug ID	Description
CLOUDSTACK-8370	volume download link will not be deleted...
CLOUDSTACK-8353	Including windows guest performance improvement flags like hv_vapic and hv_spinl...
CLOUDSTACK-8348	usagetype 6 not providing virtualmachineid...
CLOUDSTACK-8342	LDAP Password is unsecure in the Global Settings Page...
CLOUDSTACK-8339	Allow non-root credentials for adding KVM hypervisor...
CLOUDSTACK-8338	EL7 KVM host stats reporting is broken...
CLOUDSTACK-8327	Add Oracle linux guest OS for KVM ...
CLOUDSTACK-8307	UI not showing all Domains...
CLOUDSTACK-8298	xenserver VR start failed when the VR start config size is more...
CLOUDSTACK-8250	host cpu memory used reported incorrectly...
CLOUDSTACK-8247	KVM host cpu util doesn't work...
CLOUDSTACK-8231	Fail to create load-balancing service on VPC...
CLOUDSTACK-8225	Public Network ICON Missing ...
CLOUDSTACK-8212	database upgrade failed for fresh install of 4.5.0-SNAPSHOT...
CLOUDSTACK-8209	VM migration fails across KVM hosts if hosts have same hostname even if differen...
CLOUDSTACK-8150	No MySQL-HA package in debian builds...
CLOUDSTACK-8085	Fails to attach a volume (is made from a snapshot) to a VM with using local stor...
CLOUDSTACK-8009	A secure password manager...
CLOUDSTACK-8008	[Automation] Unable to list project tags using projectId parameter...
CLOUDSTACK-7961	[Automation] After Deletion of a Volume in an Account - PrimaryStorageTotal valu...
CLOUDSTACK-7959	System VMs failing to build...
CLOUDSTACK-7939	when a template is deleted and copied over again the removed column is not updat...
CLOUDSTACK-7923	RabbitMQ integration, make SSL protocol configurable rather than hard coded...
CLOUDSTACK-7857	CitrixResourceBase wrongly calculates total memory on hosts with a lot of memory...
CLOUDSTACK-7853	Hosts that are temporary Disconnected and get behind on ping (PingTimeout) turn ...
CLOUDSTACK-7839	Unable to live migrate an instance to another host in a cluster from which the t...
CLOUDSTACK-7793	[Snapshots]Create Snaphot with "quiesce" option set to true fails with "InvalidP...
CLOUDSTACK-7759	[VMWare]javax.xml.ws.soap.SOAPFaultException during system vms start...
CLOUDSTACK-7738	[Doc][Known Issue] PV tools are not getting installed on VGPU enabled Windows VM...
CLOUDSTACK-7735	Admin is not allowed deploy VM in a disabled host if hostId is parameter is not ...
CLOUDSTACK-7656	Secondary Storage VM fails to download templates served by Varnish HTTP cache...
CLOUDSTACK-7650	with wrong checksum volume got uploaded ...

Continued on next page

Table 10.1 – continued from previous page

Bug ID	Description
CLOUDSTACK-7600	[Automation] VM Failed to Start due to ConcurrentOperationException - Unable to ...
CLOUDSTACK-7591	Dynamic scaling doesn't work in CloudStack 4.4 with vmware...
CLOUDSTACK-7578	XenServerInvestigator should do better investigation in case of OVS or other net...
CLOUDSTACK-7558	[UI]list storage pools under "Migrate" root volume is not listing the primary st...
CLOUDSTACK-7539	[S3] Parallel deployment makes reference count of a cache in nfs secondary stagi...
CLOUDSTACK-7487	[UI] Public, Featured, routing option are not shown while registering templates...
CLOUDSTACK-7484	[LXC] meaningful message neededcwhen trying to attach a data disk on nfs to a LX...
CLOUDSTACK-7472	Change cloudstack agent.properties file for rhel 7 to include kvmclock.disable=t...
CLOUDSTACK-7460	[LXC][RHEl7] Agent installaion fails if Management server is already installed o...
CLOUDSTACK-7422	[Automation] Attach volume test case failing with error "Invalid configuration f...
CLOUDSTACK-7395	[Automation] Multiple Networks with LB Service are not allowed within a VPC - Ex...
CLOUDSTACK-7382	[LXC] [UI] add rhel 7 in OS type dropdown of register templates...
CLOUDSTACK-7375	[UI] RBD not available under list of protocols for primary storage during zone c...
CLOUDSTACK-7369	assignVirtualMachine API name not intuitive...
CLOUDSTACK-7318	[UI] processing wheel continue to spin even after error messaage during VM snaps...
CLOUDSTACK-7290	VO classes shouldn¹t have any class variables declared as native type...
CLOUDSTACK-7289	Bugs seen when declaring a class variable as native type (long) and have its get...
CLOUDSTACK-7271	integration.smoke.test_deploy_vm_root_resize.TestDeployVM.test_00_deploy_vm_root...
CLOUDSTACK-7258	System accounts/users are tried to be inserted twice on RPM setup...
CLOUDSTACK-7249	Enable Password Strength check for all users...
CLOUDSTACK-7222	[GPU] Windows 2012 Server instance created from Windows with PV drivers installe...
CLOUDSTACK-7142	Coverity Issues fixes and better error messages...
CLOUDSTACK-7131	RVR: router's reduandant state shown as unknown(CheckRouterCommand is failing)...
CLOUDSTACK-7080	Can't attach cluster-scope data disk to VM whose root disk is on zone-scope stor...
CLOUDSTACK-7073	Account/User creation: able to create user with the same name in the same domain...
CLOUDSTACK-7017	Ordering of templates/offerings changes per add instance modal...
CLOUDSTACK-6839	[UI][Windows] MSI Installer Wizard modifications(Including logos text etc..)...
CLOUDSTACK-6621	Intermittent failure when management server connects to hypervisor via ssh...
CLOUDSTACK-5409	Project created in a VPC does not display s2s VPN Gateway...
CLOUDSTACK-3367	When one primary storage fails, all XenServer hosts get rebooted, killing all VM...

10.1 All known issues

For the list of known issues, see Known Issues in 4.5.

Bug ID	Description
CLOUDSTACK-8234	SS VM agent fails to start due to Java error...
CLOUDSTACK-8232	UI: missing label: label.na...
CLOUDSTACK-8231	Fail to create load-balancing service on VPC...
CLOUDSTACK-8228	Allow adding hosts from different subnets in same POD...
CLOUDSTACK-8225	Public Network ICON Missing ...
CLOUDSTACK-8221	Testing on CS 4.5 SystemVM Need all Security Vulnerability...
CLOUDSTACK-8212	database upgrade failed for fresh install of 4.5.0-SNAPSHOT...
CLOUDSTACK-8210	KVM Unable to Cancel Maintenance mode after upgrade...
CLOUDSTACK-8209	VM migration fails across KVM hosts if hosts have same hostname even if differen...
CLOUDSTACK-8203	UI Bug: cloudplatform 4.5 no delete template option...
CLOUDSTACK-8202	Templates /IOS items order list is not persistent...
CLOUDSTACK-8201	KVM Snapshot to Template to New Instance is not working...

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Bug ID	Description
CLOUDSTACK-8199	Incorrect size when volumes and templates created from image snapshots...
CLOUDSTACK-8189	security group can't enable...
CLOUDSTACK-8188	using ReinstallVM display label.password.reset.confirm in the popup for the new ...
CLOUDSTACK-8187	webui: label.add.isolated.guest.network not found ...
CLOUDSTACK-8180	RouterVM does no longer provide X-ForwardedFor header with Loadbalancer...
CLOUDSTACK-8173	listCapacity api call returns less response tags than expected...
CLOUDSTACK-8172	Console proxy does not work in advance network with KVM and ACS 4.5...
CLOUDSTACK-8171	Lock related warnings seen in 4.5/master related to template_spool_ref2...
CLOUDSTACK-8168	Parameter validation API does not check params exhaustively...
CLOUDSTACK-8158	After the host reboots, the system will run out vm management IP, no matter how ...
CLOUDSTACK-8150	No MySQL-HA package in debian builds...
CLOUDSTACK-8148	dvSwitch Broken with java.lang.NumberFormatException...
CLOUDSTACK-8094	Label Issue for Migrate Volume Option in UI...
CLOUDSTACK-8092	Unable to start instance due to failed to configure ip alias on the router as a ...
CLOUDSTACK-8085	Fails to attach a volume (is made from a snapshot) to a VM with using local stor...
CLOUDSTACK-8073	listNetworkACLItem does not return cidrs...
CLOUDSTACK-8072	NPE in deleting default ACL item...
CLOUDSTACK-8043	Have all CloudStack tables's primary keys auto-increment to avoid multi-master D...
CLOUDSTACK-8019	Can't see custom service offering in the list of available service offerings ...
CLOUDSTACK-8009	A secure password manager...
CLOUDSTACK-8008	[Automation] Unable to list project tags using projectId parameter...
CLOUDSTACK-8004	Xenserver Thin Provisioning...
CLOUDSTACK-7997	[Automation] Deployment of VM is failing on Basic Zone in Few Cases - Unable to ...
CLOUDSTACK-7988	Template status is empty while the template is creating....
CLOUDSTACK-7961	[Automation] After Deletion of a Volume in an Account - PrimaryStorageTotal valu...
CLOUDSTACK-7959	System VMs failing to build...
CLOUDSTACK-7948	[Automation] Two "VOLUME.DELETE" Events are being registered instead of one - On...
CLOUDSTACK-7939	when a template is deleted and copied over again the removed column is not updat...
CLOUDSTACK-7936	System VM's are getting stuck in starting mode after Hypervisor reboot...
CLOUDSTACK-7925	test_lb_secondary_ip.py- test cases failing while creating port forwarding rule...
CLOUDSTACK-7923	RabbitMQ integration, make SSL protocol configurable rather than hard coded...
CLOUDSTACK-7922	CLONE - [Automation] [KVM] Deploying a VM with rootdisksize less than the size o...
CLOUDSTACK-7907	UI heavily broken...
CLOUDSTACK-7901	[NetAppVSC]Unable to create deployment on NetApp VSC provisioned primary storage...
CLOUDSTACK-7900	[NetAppVSC]Unable to download a volume...
CLOUDSTACK-7899	[NetAppVSC]Unable to resize a volume...
CLOUDSTACK-7893	snapshots - This operation cannot be performed because this VDI is in use by so...
CLOUDSTACK-7889	Static NAT Public IPV4 from metadata server...
CLOUDSTACK-7888	unable to create remote vpn because of special character in password...
CLOUDSTACK-7878	test_scale_vm.py - Skip test on vmware if vmware-tools are not installed...
CLOUDSTACK-7858	Implement separate network throttling rate on VR's Public NIC...
CLOUDSTACK-7857	CitrixResourceBase wrongly calculates total memory on hosts with a lot of memory...
CLOUDSTACK-7853	Hosts that are temporary Disconnected and get behind on ping (PingTimeout) turn ...
CLOUDSTACK-7848	API: updateResourceCount doesn't return all statistics...
CLOUDSTACK-7846	deploydb fails when new version doesn't have any database upgrade...
CLOUDSTACK-7844	IP Reservation in Isolated Networks doesn't work as expected...
CLOUDSTACK-7839	Unable to live migrate an instance to another host in a cluster from which the t...
CLOUDSTACK-7827	storage migration timeout, loss of data...
CLOUDSTACK-7819	Cannot add tags to project...

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Bug ID	Description
CLOUDSTACK-7813	Management server is stuck after upgrade from 4.4.0 to 4.4.1...
CLOUDSTACK-7794	SNI support when downloading templates...
CLOUDSTACK-7793	[Snapshots]Create Snaphot with “quiesce” option set to true fails with “InvalidP...
CLOUDSTACK-7789	I was updated from version 4.4.0 of Apache CloudStack to 4.4.1. It does not work...
CLOUDSTACK-7782	The 4.4.1 web UI is missing “Acquire new IP address” buton in NIC section...
CLOUDSTACK-7775	Xen S3 backed secondary storage - local volume snapshots fail...
CLOUDSTACK-7759	[VMWare]javax.xml.ws.soap.SOAPFaultException during system vms start...
CLOUDSTACK-7751	Autoscaling without netscaler...
CLOUDSTACK-7750	Xen server can not mount secondary CIFS storage...
CLOUDSTACK-7738	[Doc][Known Issue] PV tools are not getting installed on VGPU enabled Windows VM...
CLOUDSTACK-7735	Admin is not allowed deploy VM in a disabled host if hostId is parameter is not ...
CLOUDSTACK-7734	CLONE - addHost fails for XenServer with vSwitch networking...
CLOUDSTACK-7710	Triage and fix Coverity defects...
CLOUDSTACK-7708	Triage and fix Coverity defects...
CLOUDSTACK-7705	Triage and fix Coverity defects...
CLOUDSTACK-7695	cache disk policy not recording into the database...
CLOUDSTACK-7687	Cannot create VM from qcow2 template...
CLOUDSTACK-7656	Secondary Storage VM fails to download templates served by Varnish HTTP cache...
CLOUDSTACK-7650	with wrong checksum volume got uploaded ...
CLOUDSTACK-7640	Failed to delete template that failed to download...
CLOUDSTACK-7639	cidrlist is not updated in the database after calling API updateNetworkACLItem...
CLOUDSTACK-7638	cidrlist is empty in the response of API listNetworkACLs...
CLOUDSTACK-7636	Cloudstack 4.4.0 management package for Ubuntu 12.04 has wrong dependencies...
CLOUDSTACK-7633	Most init scripts provide an invalid name for LSB header “Provides”...
CLOUDSTACK-7614	Cannot create network offering with OVS for VPC on KVM...
CLOUDSTACK-7600	[Automation] VM Failed to Start due to ConcurrentOperationException - Unable to ...
CLOUDSTACK-7594	[Task] Add test path test cases for Stopped VM...
CLOUDSTACK-7592	Dynamically Scalablity state doesn’t update after restoring the VM....
CLOUDSTACK-7591	Dynamic scaling doesn’t work in CloudStack 4.4 with vmware...
CLOUDSTACK-7578	XenServerInvestigator should do better investigation in case of OVS or other net...
CLOUDSTACK-7577	The response of the ‘deleteVolume’ API command contains a wrong type ...
CLOUDSTACK-7558	[UI]list storage pools under “Migrate” root volume is not listing the primary st...
CLOUDSTACK-7539	[S3] Parallel deployment makes reference count of a cache in nfs secondary stagi...
CLOUDSTACK-7512	Failing to destroy eth0/bond0 on xenserver hv...
CLOUDSTACK-7489	Unable to expunge VM due to failing to revoke all static nat rules...
CLOUDSTACK-7488	Releasing an IP address that has a LBR with a SSL certificate does not remove th...
CLOUDSTACK-7487	[UI] Public, Featured, routing option are not shown while registering templates...
CLOUDSTACK-7484	[LXC] meaningful message neededcwhen trying to attach a data disk on nfs to a LX...
CLOUDSTACK-7482	Ajax calls in mgmt UI causing log pollution...
CLOUDSTACK-7472	Change cloudstack agent.properties file for rhel 7 to include kvmclock.disable=t...
CLOUDSTACK-7460	[LXC][RHEl7] Agent installaion fails if Management server is already installed o...
CLOUDSTACK-7457	Unable to launch VM after unexpected Hypervisor Reboot (out of band)...
CLOUDSTACK-7449	“CloudRuntimeException: Can not see storage pool” after trying to add a new host...
CLOUDSTACK-7446	Openvswitch plugin has duplicate names...
CLOUDSTACK-7443	Cannot launch SSVMs when using Swift as Secondary Storage...
CLOUDSTACK-7422	[Automation] Attach volume test case failing with error “Invalid configuration f...
CLOUDSTACK-7420	Creating a stickiness policy for a load balancer rule that has protocol SSL will...
CLOUDSTACK-7418	Deleting a load balancer rule that has an SSL cert assigned to it does not delet...
CLOUDSTACK-7414	SSVM 4.4.0-6 fails to connect to NFS v3 and v4.1 shares...

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Bug ID	Description
CLOUDSTACK-7411	VM instance does not start when you use at the same time the Region level VPC an...
CLOUDSTACK-7410	OVS distributed routing + KVM / NameError: name 'configure_ovs_bridge_for_routin...
CLOUDSTACK-7406	Templates using Swift provider reports physical size, and not the virtual size i...
CLOUDSTACK-7395	[Automation] Multiple Networks with LB Service are not allowed within a VPC - Ex...
CLOUDSTACK-7382	[LXC] [UI] add rhel 7 in OS type dropdown of register templates...
CLOUDSTACK-7375	[UI] RBD not available under list of protocols for primary storage during zone c...
CLOUDSTACK-7369	assignVirtualMachine API name not intuitive...
CLOUDSTACK-7365	Upgrading without proper systemvm template corrupt cloudstack management server...
CLOUDSTACK-7364	NetScaler won't create the Public VLAN and Bind the IP to it...
CLOUDSTACK-7348	[Automation] InvalidParameter Exception with stacktrace in MS log wile executing...
CLOUDSTACK-7342	Fail to delete template while using Swift as Secondary Storage...
CLOUDSTACK-7325	bug in iSCSI disconnectPhysicalDiskByPath...
CLOUDSTACK-7324	listAsyncJobs returns jobs with no cmd...
CLOUDSTACK-7318	[UI] processing wheel continue to spin even after error messaage during VM snaps...
CLOUDSTACK-7300	Cannot create Snapshot on KVM...
CLOUDSTACK-7299	apt-get install cloudstack-management Ubuntu 14.04.1...
CLOUDSTACK-7298	apt-get install cloudstack-management Ubuntu 14.04.1...
CLOUDSTACK-7290	VO classes shouldn¹t have any class variables declared as native type...
CLOUDSTACK-7289	Bugs seen when declaring a class variable as native type (long) and have its get...
CLOUDSTACK-7283	Allow regular user to execute listUsers API call...
CLOUDSTACK-7276	xenserver host add error...
CLOUDSTACK-7271	integration.smoke.test_deploy_vm_root_resize.TestDeployVM.test_00_deploy_vm_root...
CLOUDSTACK-7262	Affinity Groups UI Icon is wrong...
CLOUDSTACK-7258	System accounts/users are tried to be inserted twice on RPM setup...
CLOUDSTACK-7249	Enable Password Strength check for all users...
CLOUDSTACK-7222	[GPU] Windows 2012 Server instance created from Windows with PV drivers installe...
CLOUDSTACK-7216	Cloudstack 4.4 on Xen 6.2 ERROR: Java process not running...
CLOUDSTACK-7214	[LDAP] connection timeout is hardcoded to 500ms...
CLOUDSTACK-7200	[LDAP] importUsersCmd for a group fails incase any member of a group is not an u...
CLOUDSTACK-7142	Coverity Issues fixes and better error messages...
CLOUDSTACK-7131	RVR: router's reduandant state shown as unknown(CheckRouterCommand is failing)...
CLOUDSTACK-7094	Update PV-tools in all the VMs in case of xenserver upgrade to avoid PV-tools er...
CLOUDSTACK-7093	GPU enabled VMs are always showing xen-tools as installed even though if tools a...
CLOUDSTACK-7088	Snapshot manager should search for guest OS including deleted...
CLOUDSTACK-7080	Can't attach cluster-scope data disk to VM whose root disk is on zone-scope stor...
CLOUDSTACK-7073	Account/User creation: able to create user with the same name in the same domain...
CLOUDSTACK-7049	APIs return sensitive information which CloudStack does not manage and which cal...
CLOUDSTACK-7017	Ordering of templates/offerings changes per add instance modal...
CLOUDSTACK-6974	IAM-Root Admin - When listNetwork is used with listall=false (or no listall pass...
CLOUDSTACK-6973	IAM - listNetworks - When Domain Admin calls listNetwork with listall=false , is...
CLOUDSTACK-6952	Building from Source Doc needs updating...
CLOUDSTACK-6939	IAM - DomainAdmin - Not able to listNetwork belonging to a subdomain by passing ...
CLOUDSTACK-6937	IAM - ROOT admin - Not able to list network owned by accounts under any domain b...
CLOUDSTACK-6928	IOPS throttling setting isn't applied to a dinamically attached volume...
CLOUDSTACK-6927	Security group python script has several issues...
CLOUDSTACK-6900	If we download a volume and then migrate the same volume, then migration fails....
CLOUDSTACK-6881	MS:IPv4 Incorrect IPv4 address as iptonetworklist param raises insufficient addr...
CLOUDSTACK-6870	getDomainId implementation returns invalid value at places...
CLOUDSTACK-6851	ResourceTagResponse does not have "id" field due to which resource level permiss...

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Bug ID	Description
CLOUDSTACK-6841	[OVS] Remote_ips for tunnel ports are not configured properly in case of multipe...
CLOUDSTACK-6839	[UI][Windows] MSI Installer Wizard modifications(Including logos text etc..)...
CLOUDSTACK-6828	[OVS] Tunnel ports are not getting deleted even failure in vm deployment...
CLOUDSTACK-6811	Allocated capacity is greater than the total capacity for primary storage with o...
CLOUDSTACK-6807	[HyperV] [Doc] Hyper-v requires all virtual switch names should be same across t...
CLOUDSTACK-6797	volume resize should not be allowed for detached volumes...
CLOUDSTACK-6796	[OVS]Failure in network update does not change network offering to original offe...
CLOUDSTACK-6772	[UI]need to change popup message fo Attach volume failure "Unexpected exceptio...
CLOUDSTACK-6765	unable to create primary storage...
CLOUDSTACK-6762	[OVS]Flow rules to drop Broadcast/Multicast traffic on tunnel ports are not adde...
CLOUDSTACK-6748	Creating an instance with user-data when network doesn't support user-data shoul...
CLOUDSTACK-6724	Generate only alert message in MS for an iteration in router vm ...
CLOUDSTACK-6719	OVS:VPC:UI wizard allowing to add non OVS enabled network to distributed VPC...
CLOUDSTACK-6717	[OVS][UI]VPC network creation page does not display custom network offering crea...
CLOUDSTACK-6716	/usr has been sized to small and ends up being 100% full on SSVM and CVM...
CLOUDSTACK-6707	[SDN] OVS bridge/tunnel ports are not getting deleted from Host even though ther...
CLOUDSTACK-6705	[SDN] VNI range is not allowing more than 2147483647 as a maximum vnet range...
CLOUDSTACK-6698	listResourceDetals - normal user able to list details not belonging to it...
CLOUDSTACK-6670	A lot of "IAMServiceImpl] (main:null) Invalidate IAM cache" message in log until...
CLOUDSTACK-6635	more details required in Alert generated in MS from router vm ...
CLOUDSTACK-6623	Register template does not work as expected, when deploying simulator and xen zo...
CLOUDSTACK-6621	Intermittent failure when management server connects to hypervisor via ssh...
CLOUDSTACK-6515	VMware: Only updating chain_info in volumes table when VM is started...
CLOUDSTACK-6514	VMware: Is space allocated for snapshots counted correctly?...
CLOUDSTACK-6460	Migration of CLVM volumes to another primary storage fail...
CLOUDSTACK-6430	[SDN] CS asks for vlan range even we create physical network with GRE isolation ...
CLOUDSTACK-6420	Network implement: use network stateMachine instead of explicitly setting the st...
CLOUDSTACK-6403	ListApi Responses does not have "count" parameter and response arrays defined as...
CLOUDSTACK-6378	SSL: Fail to find the generated keystore....
CLOUDSTACK-6320	Upgrade 4.1.1 -> 4.3.0 OVS provider should be inserted to the physical network...
CLOUDSTACK-6307	java.lang.Exception: Uanble to find management port group null...
CLOUDSTACK-6274	Scope issue attaching a disk to a VM...
CLOUDSTACK-6248	Improve getting alerts from VR to execute in parallel in case of multipleVRs...
CLOUDSTACK-6220	Cloudstack agent fails to start due to broken init script...
CLOUDSTACK-6213	Add new field to API @Parameter indicating if the param should be skipped from l...
CLOUDSTACK-6169	assignVirtualMachine leaves associated tags assigned to old account...
CLOUDSTACK-5883	unable to copy vmware routing template to primary storage...
CLOUDSTACK-5847	[Hyper-V] [doc] Document creation of external vswitch for Hyper-V 2012 R2 (unlik...
CLOUDSTACK-5832	Separate remote access VPN service from site 2 site vpn Service...
CLOUDSTACK-5794	[Hyper-v] Specify username and domain name together in the username field while ...
CLOUDSTACK-5738	Recurring Snapshots - Few Snapshots are stuck in "Creating" state for more than ...
CLOUDSTACK-5736	KVM - Recurring Snapshots - Snapshots reported as being in "BackedUp" state even...
CLOUDSTACK-5583	vmopsSnapshot plug-in (XenServer) does not return an error when it should...
CLOUDSTACK-3383	GetHostStatsCommand fails when agent is running Ubuntu 13.04 (raring)...
CLOUDSTACK-3367	When one primary storage fails, all XenServer hosts get rebooted, killing all VM...
CLOUDSTACK-252	UpdateNetwork Operation on a guest network that is currently using Virtual Route...